HOMEOSTASIS

Unit Outcomes:

1. Explain what is meant by the concept of homeostasis.

2. Using humans as an example, explore ways that behaviors and systems respond to changes in the external environment.

Oct 13-9:45 AM

Charles Blagden (Royal Society of London)

- experimented in 1775 with the human body's ability to withstand heat. He had a room heated to 126°C and entered the room with his pet dog and a piece of meat.

- A few hours later
  - both Blagden and his dog left the room with no ill effects
  - the meat was cooked

Conclusions:
- the body has internal physiological and biochemical mechanisms that allows it to maintain a stable state. (feed-back mechanisms)

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Homeostasis

- derived from the Greek, homeo ("constant") and stasis ("stable")

- is a state of balance in the body

- process and activities that help maintain homeostasis are referred to as homeostatic mechanisms.

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Can you think of a few ways that you are exposed to ever changing environmental conditions?

ex. air conditioning in the summer

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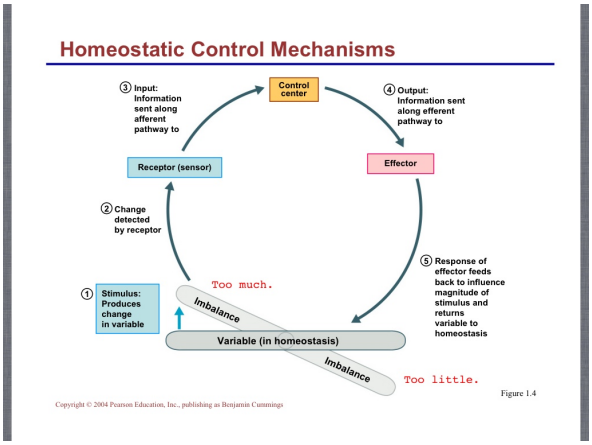
- maintained through the use of feedback systems
  - ex negative feedback system cause a decrease in function in response to some kind of stimulus in hopes of stabilizing the system



- inability to remain in homeostasis can result in death or may lead to a condition known as homeostatic imbalance.
  ex. diabetes

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Internal Communication and Homeostasis

- The body has a good internal communication network using the endocrine and nervous system

- These communication system will stimulate the negative feedback loops in response to changes in the internal environment of the body

  ex shivering in response to cooling of the body or sweating when the core temperature get too hot

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Explain the process of homeostasis in terms of temperature regulation.

In your explanation be sure to underline or highlight where you use the following terms:

1) negative feedback loop - homeostatic mechanism that detects and reverses deviations from normal homeostasis levels. Consists of a sensory receptor, an integrator and effector.

2) sensory receptor - cells or groups of cells scattered throughout the body that work continually to receive information about the body's internal conditions

3) integrator - receives messages from receptors and sends instructions to effectors. ex: hypothalamus in the brain

4) effectors - structure that receives information from the integrator and makes changes to the body's internal conditions

5) vasodilation - expansion of the diameter of blood vessels

6) vasoconstriction - decrease in the diameter of blood vessels

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